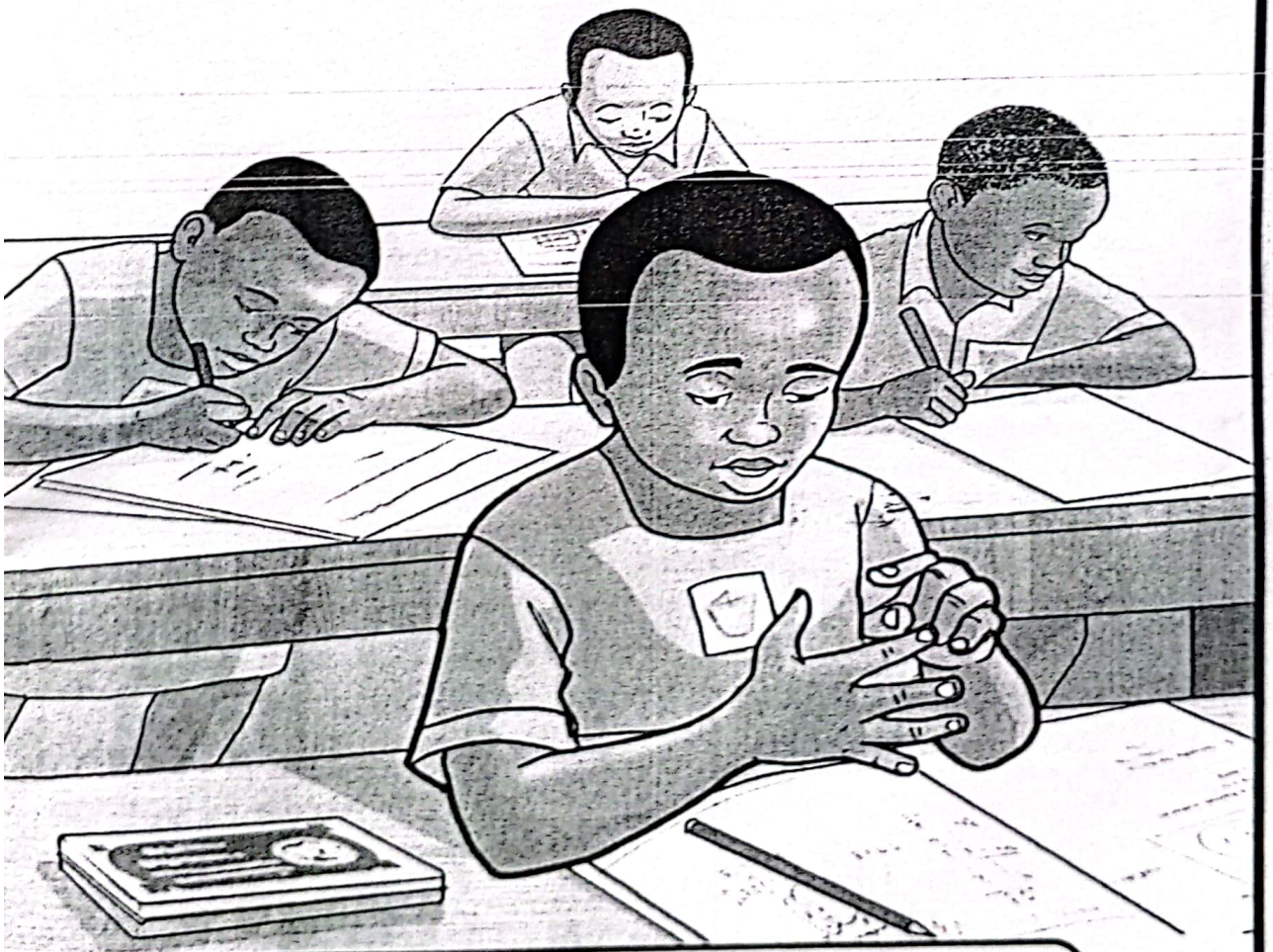
SUREKEY EXAMINATIONS BOARD

"Don't speak for Quality, Let Quality Speak for itself"

2024



MATHEMATICS UNIQUE SERIES

OFFICIAL MARKING GUIDE

SECTION A: 40 MARKS

Answer **all** questions in this section

Questions **1** to **20** carry **two** marks each

1. Workout:

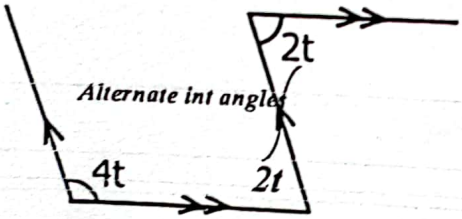
$$\begin{array}{r} 9\ 6\ 6 \\ -\ 3\ 4\ 0 \\ \hline 6\ 2\ 6 \\ \hline \end{array}$$

$6 - 0 = 6$
$6 - 4 = 2$
$9 - 3 = 6$

2. Express 439 as a Roman Numeral.

$439 = 400 + 30 + 9$
$= CD\ \ XXX\ \ IX$
$= CDXXXIX$

3. Find the value of t in the diagram below.



$4t + 2t = 180^0$ *(Co int angles)*
$\frac{6t}{6} = \frac{180^0}{6}$
$t = 30^0$

4. Given that Set F = {a, b, c, d} and Set W = {b, n, e, f, a}. Find the number of subsets from F ∩ W.

$F \cap W = \{a, b\}$
$n(F \cap W) = 2$
Number of subsets $= 2^n$
$= 2^2$
$= 2 \times 2$
$= 4$

5. Robinah goes shopping every after 9 days and Rebecca goes every after 5 days. If the two girls went shopping together today, after how many days will they shop together again on the same day?

$LCM =$

3	5	9
3	5	3
5	5	1
	1	1

$LCM = 3 \times 3 \times 5$
$= 9 \times 5$
$= 45$

Therefore, they will shop together again on the same day after 45 days

6. Find the number whose scientific notation is 5.48×10^{-3}

$\frac{548}{100} \times \frac{1}{10^3}$

$\frac{548 \times 1}{100 \times 1000}$

$\frac{548}{100000}$

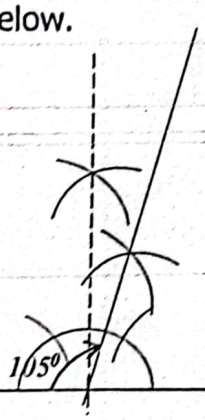
$5.48 \times 10^{-3} = 0.00548$

7. Write 1,200,360 in words.

Millions	Thousands	Units
1	200	360

One million, two hundred thousand, three hundred sixty.

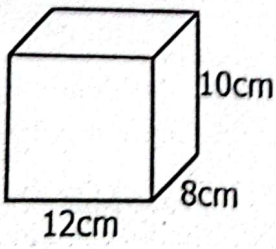
8. Using a ruler, a pencil and a pair of compasses only, construct an angle of 105^0 in space below.



9. Draw tallies to represent the product of 3 and 8.

Product of 3 and 8	Number of bundles	
3 x 8 24	24 ÷ 5 = 4 rem 4	𝍸 𝍸 𝍸 𝍸 𝍸 ||||

10. The rectangular prism below measures 12cm by 8cm by 10cm.



Calculate the total surface area of the prism.

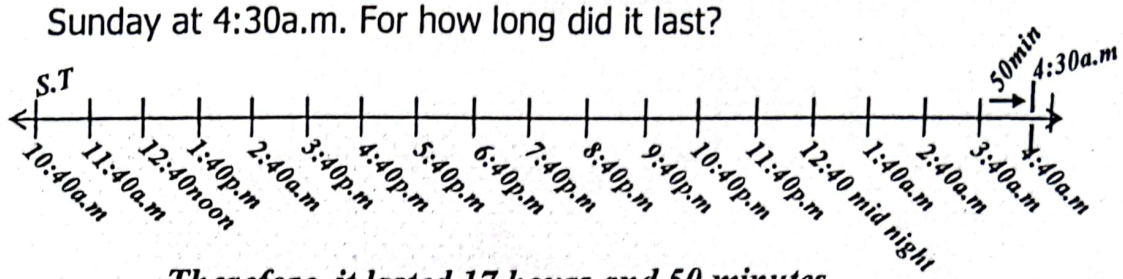
$TSA = 2lw + 2wh + 2lh$

$= (2 \times 12cm \times 8cm) + (2 \times 8cm \times 10cm) + (2 \times 12cm \times 10cm)$

$= 192cm^2 + 160cm^2 + 240cm^2$

$= 592cm^2$

11. A musical festival started on Saturday at 10:40a.m. and ended on Sunday at 4:30a.m. For how long did it last?

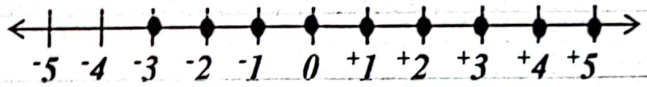


Therefore, it lasted 17 hours and 50 minutes

	OR	
Duration from 10:40a.m to noon	***From noon to 12:00a.m***	***Total Duration***
12:00	*24:00*	*12:00*
− 10:40	*−12:00*	*1:20*
1:20	*12:00hrs*	*+ 4:30*
1hour and 20 minutes		*17:50*
		= 17h and 50 minutes

12. Solve and write the solution set for $2(4 - h) < 16$.

$$8 - 2h < 16$$
$$8 - 8 - 2h < 16 - 8$$
$$-2h < 8$$
$$\frac{-2h}{-2} > \frac{8}{-2}$$
$$h > -4$$



$h : h = \{-3, -2, -1, 0, +1 \ldots\}$

13. A man bought a box of tomatoes where 25% of them were rotten and only 72 tomatoes were good. How many tomatoes were in the box?

Percentage for good tomatoes

100% − 25%

75%

Number of tomatoes in the box

$72 \div \frac{75}{100}$

$72 \times \frac{100}{75}$

96 tomatoes

14. Find the sum of all prime numbers between 80 and 90.

Prime numbers

{2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, (83) (89) 97 ...}

$Sum = 83 + 89$

$= 172$

15. The eucalyptus tree was the 21st tree from either side of the line of trees that make one side of the perimeter fence of the school. Find the number of trees on that side of the perimeter fence.

Number of trees = *(Position x 2) – 1*
= *(21 x 2) – 1*
= *42 – 1*
= *41 trees.*

16. The temperature in Mbale at 6:00a.m. was $^{-}10^{0}$c. It rose up to 6^{0}c in the evening. What was the temperature rise?

New temp – Old temp
$6^{0}c - {}^{-}10c$
$6^{0}c - (^{-}10c)$
$6^{0}c + 10c$
16c

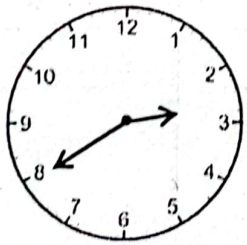
17. What number has been expanded to give;

$(6 \times 100) + (7 \times 10) + (3 \times 10^{-2}) + (4 \times 10^{-3})$

$600 + 70 + 3 \times \frac{1}{100} + 4 \times \frac{1}{1000}$
$600 + 70 + \frac{3}{100} + \frac{4}{100}$
$600 + 0.03 + 0.004$

600
70
0.03
+ 0.004
670.034

18. Convert the afternoon time shown on the clock face below to 24-hour clock.



Afternoon Time is 2:40p.m

In 24 hour clock
12:00
+ 2:40
1440hrs

19. Simplify: 13mn – 8bc – 4mn – 6bc.

13mn – 4mn – 8bc – 6bc
9mn – 14bc

20. An athlete covers 176 metres in two laps of a circular running truck. What is the diameter of the running truck? (Use π as $\frac{22}{7}$)

2 laps → *176m*
1 lap → $\frac{176m}{2}$
1 lap → *88m*
1 lap = circumference

$\pi d = C$
$\frac{22}{7} d = 88m$
$\frac{22}{7} d \times 7 = 88m \times 7$

$\frac{22d}{22} = \frac{88m \times 7}{22}$
$d = 4m \times 7$
$d = 28m$

SECTION B: 60 MARKS

Answer **all** the questions in this section

Marks for each question are indicated in brackets

21. The interior and exterior angles of a regular polygon are in the ratio of 3:2 respectively.

(a) How many sides does the polygon have? (03 Marks)

Int <	Ext <	Sum
3	2	5

5 parts rep 180^0

1 part rep $\frac{180^0}{5}$

1 part rep 36^0

Ext angle $= 36^0 \times 2$

$= 72^0$

Number of sides $= \frac{360^0}{ext <}$

$= \frac{360^0}{72^0}$

$= \frac{360^0}{72^0}$

Number of sides $= 5$

(b) Find the number of right angles the polygon has. (02 Marks)

Number of right angles $= 2n - 4$

$= (2 \times 5) - 4$

$= 10 - 4$

$= 6$

22. One weekend, Bulya had Sh.50,000 from which he bought the items in the table below and was given a change of Sh.2,100. By show of working, complete the shopping table below. (06 Marks)

Item	Quantity	Unit Cost	Total Cost
Bathing soap	5 tablets	Sh. *4000* per tablet	Sh. *20000*
Sugar	*$3\frac{1}{4}$ kg*	Sh. 3,600 @ kg.	Sh.11,700
Cooking oil	600m*l*	Sh.7000 per litre	Sh. *4200*
Bread	2 loaves	Sh. *6000* per loaf	Sh.12,000
TOTAL EXPENDITURE			Sh. *47900*

Total Cost
Sh. 50000
– Sh. 2100
Sh. 47900

Sugar
Sh. 11,100
Sh. 3600
$3\frac{1}{4}$ kg

Cooking oil
600 x sh.7000
1000
Sh.4200

Bread
Sh.12000
2
Sh. 6000

Total
sh.11700
sh. 4200
+ sh.12000
sh.27900

Soap
Sh. 47900
– Sh. 27900
Sh.20000
Sh.20000 ÷ 5
Sh.4000

23. A man was given a job of extending 400 bricks from a kiln to a construction site. In every trip, the man carried 20 less bricks than the previous trip.

(a) If the man carried all the bricks in 4 trips, how many bricks did he carry in the first trip? (03 Marks)

Let the brick carried in the 1st trip be y

1st trip	2nd trip	3rd trip	4th trip
y	$y-20$	$y-40$	$y-60$

$$y+y-20+y-40+y-60 = 400$$
$$4y-120 = 400$$
$$4y-120+120 = 400+120$$
$$4y = 520$$
$$\frac{4y}{4} = \frac{520}{4}$$
$$y = 130$$

Therefore, he carried 130 brick in the first trip

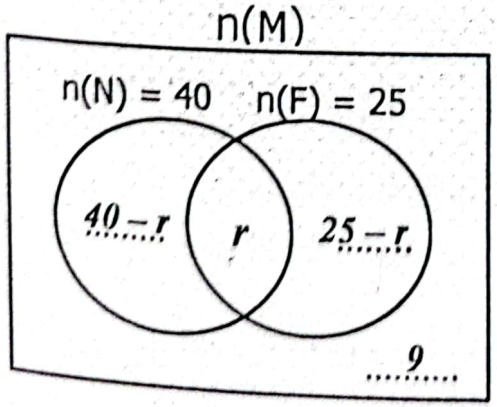
(b) On average, how many bricks did he carry? (02 Marks)

$$Average = \frac{S.O.D}{N.O.D}$$
$$= \frac{400}{4}$$
$$= 100$$

Therefore, on average, he carried 100 bricks.

24. In a restaurant, all the 55 customers ordered for Mineral water (M) 25 customers ordered for Fanta (F) and Mineral water, 40 customers ordered for Novida (N) and Mineral water. 9 customers ordered for only mineral water while r customers ordered for all the three kinds of drinks.

(a) Use the above information to complete the Venn diagram below. (03 Marks)



b) How many customers ordered for at least two kinds of drinks? (03 Marks)

Value of r

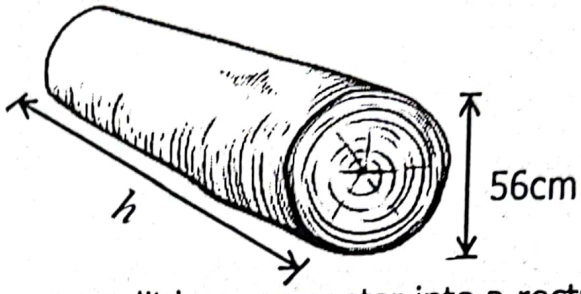
$$40-r+r+25-r+9 = 55$$
$$40+25+9-r = 55$$
$$74-r = 55$$
$$74-74-r = 55-74$$
$$-r = -19$$
$$-1(-r) = -1(-19)$$
$$r = 19$$

Number of Customers who ordered for at least two kinds of drinks

$$(40-r)+r+(25-r)$$
$$(40-19)+19+(25-19)$$
$$21+19+6$$

46 customers

25. The diagram below shows a tree log of height (h) and a diameter of 56cm. Use it to answer the questions that follow.



(a) If the log was split by a carpenter into a rectangular piece to make a window, work out the length of the window formed. (Use π as $\frac{22}{7}$) (02 Marks)

Length = Circumference

$C = \pi d$

$= \frac{22}{7} \times 56\ cm$

$= 22 \times 8\ cm$

$= 176\ cm$

The length of the window is 176 cm

(b) If the area of the window formed was 8800cm^2, find the height of the log. (02 Marks)

Height (h) = Width

$l \times w = Area$

$176cm \times w = 8800\ cm^2$

$\frac{176cm \times w}{176cm} = \frac{8800\ cm \times cm}{176cm}$

$w = 50\ cm$

The height of the log is 50 cm

26. Kabasiita drove a car from town Z to town Y at a speed of 88km/h in $3\frac{1}{2}$ hours. She rested at town Y for half an hour and drove back at an average speed of 77km/h. Calculate Kabasiita's average speed for the whole journey. (05 Marks)

Distance from Z to Y

$D = S \times T$

$= 88\ km/h \times 3\frac{1}{2}\ h$

$= 88\ km \times \frac{7}{2}$

$= 44\ km \times 7$

$= 308\ km$

Time from Y to T

$T = D \div S$

$= 308km \div \frac{77km}{h}$

$= 308km \times \frac{h}{77}$

$= 4\ h$

Average Speed

$AVS = \frac{T.D.C}{T.T.T}$

$= \frac{308\ km \times 2}{(3\frac{1}{2} + \frac{1}{2} + 4)h}$

$= \frac{616km}{8\ h}$

$= 77\ km/h$

27. (a) Given that $16 = 31_m$, find the value of the unknown base m. (02 Marks)

$16 = (3 \times m^1) + (1 \times m^0)$
$16 = (3 \times m) + (1 \times 1)$
$16 = 3m + 1$
$16 - 1 = 3m + 1 - 1$
$\frac{15}{3} = \frac{3m}{3}$
$5 = m$
m is base five

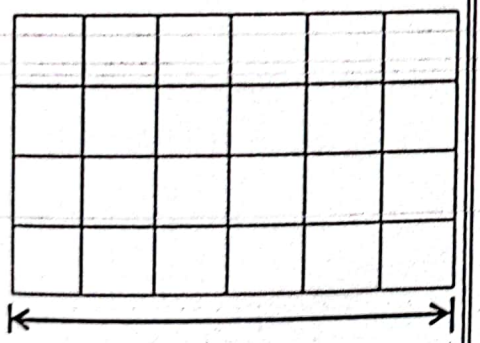
(b) Workout:

Kg	g
7	1350
~~8~~	~~350~~
− 2	620
5	730

(02 Marks)

(1000 + 350) − 620
1350 − 620
730

28. A builder laid square tiles in a rectangular room of length 270cm as shown in the diagram below. Study and use it to answer the questions that follow.



(a) Find the width of the room. (02 Marks)

6 square boxes rep 270 cm
1 square box rep $\frac{270\ cm}{6}$
4 square boxes rep $\frac{270\ cm}{6} \times 4$
4 suare boxes rep 45 cm x 4
4 square boxes rep 180cm
Therefore, the width is 180cm

(a) Calculate the area occupied by 5 tiles. (02 Marks)

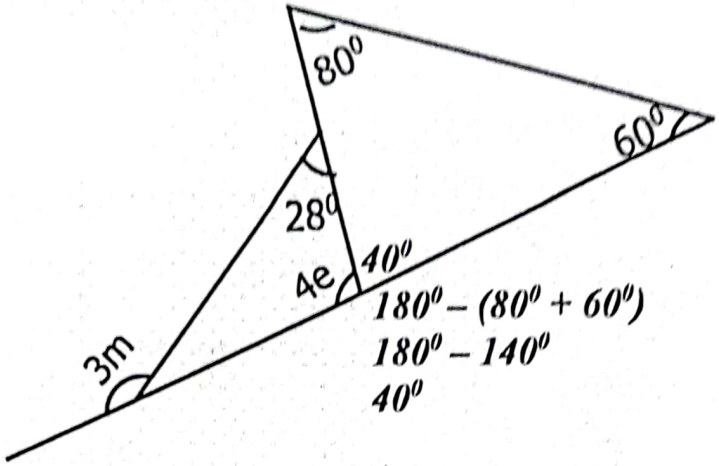
Area of 1 square box
Area = S x S
= 45 cm x 45 cm
= 2025 cm²

Area of 5 square boxes
Area = 2025 cm² x 5
= 10125 cm²

(b) Workout the perimeter of the room. (02 Marks)

Perimeter = 2 (l + w)
= 2 (270 cm + 180 cm)
= 2 x 450 cm
= 900 cm

29. Study the diagram below and use the information on it to answer the questions that follow.



Find the value of;

(i) e (02 Marks)

$4e = 80^0 + 60^0$

$4e = 140^0$

$\frac{4e}{4} = \frac{140^0}{4}$

$e = 35^0$

(ii) m (02 Marks)

$3m = 4e + 28^0$

$3m = 140^0 + 28^0$

$3m = 168^0$

$\frac{3m}{3} = \frac{168^0}{3}$

$m = 56^0$

30. In a market, $\frac{1}{4}$ of the traders sell Irish potatoes, $\frac{1}{3}$ sell fruits, $\frac{3}{10}$ of the remainder sell vegetables and the remaining 35 traders sell matooke.

(a) What fraction of the traders in the market sell matooke? (03 Marks)

Irish + fruits	*Remainder*	*Vegetables*	*Matooke*
$\frac{1}{4} + \frac{1}{3}$	$\frac{12}{12} - \frac{7}{12}$	$\frac{3}{10}$ of $\frac{5}{12}$	$\frac{5}{12} - \frac{1}{8}$
$\frac{3+4}{12}$	$\frac{12-7}{12}$	$\frac{3 \times 5}{10 \times 12}$	$\frac{10-3}{24}$
$\frac{7}{12}$	$\frac{5}{12}$	$\frac{1}{8}$	$\frac{7}{24}$

(b) Find the total number of traders in the market. (02 Marks)

$35 \div \frac{7}{24}$

$35 \times \frac{24}{7}$

5×24

120 traders

31. A business woman borrowed some money from Centenary bank at an interest rate of $20\frac{1}{2}$ % per annum. She was given a bundle of twenty thousand shilling notes numbered consecutively from CT0237458 to CT0237507.

(a) How much money did she borrow? (02 Marks)

Number of Notes	*Amount*
CT0237507	*sh.20000 x 46*
– CT0237458	*sh.920000*
45 + 1	
46 notes	

(b) Calculate the total amount of money the business woman paid back to the bank after 6 months. (03 Marks)

$S.I = PRT$

$= sh.\ 920000 \times \frac{20.5}{100} \times \frac{6}{12}$

$= sh.\ 4600 \times 20\frac{1}{2} \times \frac{1}{2}$

$= sh.\ 4600 \times \frac{41}{2}$

$= sh.2300 \times 41$

$S.I = sh.94300$

Amount paid back

sh.	*920000*
+ sh.	*94300*
sh.	*1014300*

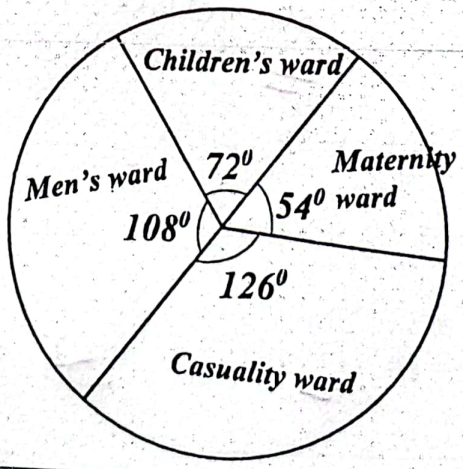
32. The information below was found on the noticeboard of Akopor Hospital showing the number of patients admitted in different wards in a certain month.

Ward	No. of Patients
Maternity Ward	15
Casualty Ward	35
Men's ward	30
Children's ward	20

Display the above information on a circle graph of radius 3.5cm in the space provided below. (05 Marks)

$$\text{Total Number of patients} = 15 + 35 + 30 + 20 = 100$$

Maternity	Children	Men	Casuality
$\frac{15 \times 360^0}{100}$	$\frac{20 \times 360^0}{100}$	$\frac{30 \times 360^0}{100}$	$\frac{35 \times 360^0}{100}$
54^0	72^0	108^0	126^0



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